Hard Disk Read-Write Mechanism Based Upon EM Wavefront Magnetic Force Bridging

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Introduction

Building upon the concept of 14 August 2025 which has application for generating quantum entanglement of atoms, the EM wavefront magnetic bridging effect described has application for enabling more dense storage of data on hard disk drives. The following concept may sound similar to Toshiba's concept of Microwave-Assisted Magnetic Recording which reportedly doubles storage capacity, but is quite distinct and allows for a far more granular read/write capability based upon entirely different principles.

Abstract

Whereas Toshiba's concept is based upon using a microwave in order to generate magnetic disorder in a select area in order to render an area magnetically neutral so as to reduce the amount of energy needed from an electromagnet in order to change a magnetic polarization (i.e. it takes far less energy to flip a "neutral" atom to a "North" than a "South" to a "North,") this concept is entirely different.

Because the length of an EM wavefront can be used to bridge weak magnetic effects over a comparatively great distances (and, necessarily, to temporally restrict the duration of translational effects) it should be possible to execute both read and write operations using a solid-state rather than an electromagnet which is in a fixed position and a pair of microwave emitters sitting in different positions, equidistant from the writing surface, each of which can emit EM in a distinct and precise direction in order to achieve the desired effects.

When a write operation is desired, the left-most extreme of a precision EM wave would be made to strike the desired surface area and the right-most extreme of the wave at the solid-state magnet simultaneously, causing the magnetism, which would not otherwise be nearby enough to affect the surface, to be translated to a specific area of one or two atoms in diameter, thereby changing polarization.

When a read operation is desired, a separate microwave emitter is fired so that an EM wavefront's right-most extreme strikes the writing surface at the same instant that it arrives at a magnetically neutral sensor mechanism some distance away, whereas the left-most extreme of the EM wavefront would strike the sensor at the same instant as the other extreme reached the writing surface.

A combination of reduced emitter power, a near-parallel strike angle and a masking mechanism to prevent the EM wave from interacting in undesired

areas would enable magnetic force to be translated in either direction in the aforementioned manner.

Conclusion

Although this concept would require a zero-vibration environment and may necessitate periodically restoring the magnetic polarity of information being read more than a certain number of times, it opens the door to storage densities approximately 40-fold greater than current methods.